State of CERES

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NASA Langley Research Center, Hampton, VA

CERES Science Team Meeting, April 22-24, 2014
NASA Langley Research Center, Hampton, VA

Happy Earth Day!

CERES Meeting Objectives

1. Review status of CERES Instruments and Data Products:

- Status of NASA & CERES Project
- CERES Terra, Aqua and SNPP SW/LW/TOTAL Channel Calibration Update
- CERES FM6 and RBI Update
- CERES SNPP SSF Edition-1: VIIRS Cloud Algorithm & Validation Status
- CERES GEO Cloud Algorithm Status
- CERES Edition-4 ADM Validation status
- SOFA, SARB and TISA Working Group Reports
- Data Management Team Update: Terra/Aqua/SNPP
- Atmospheric Sciences Data Center (ASDC) Update
- CERES Education Outreach

2. Invited Presentations Session: Each presentation is 45 min.

3. Contributed Science Reports. Each report is 20 min including time for questions.

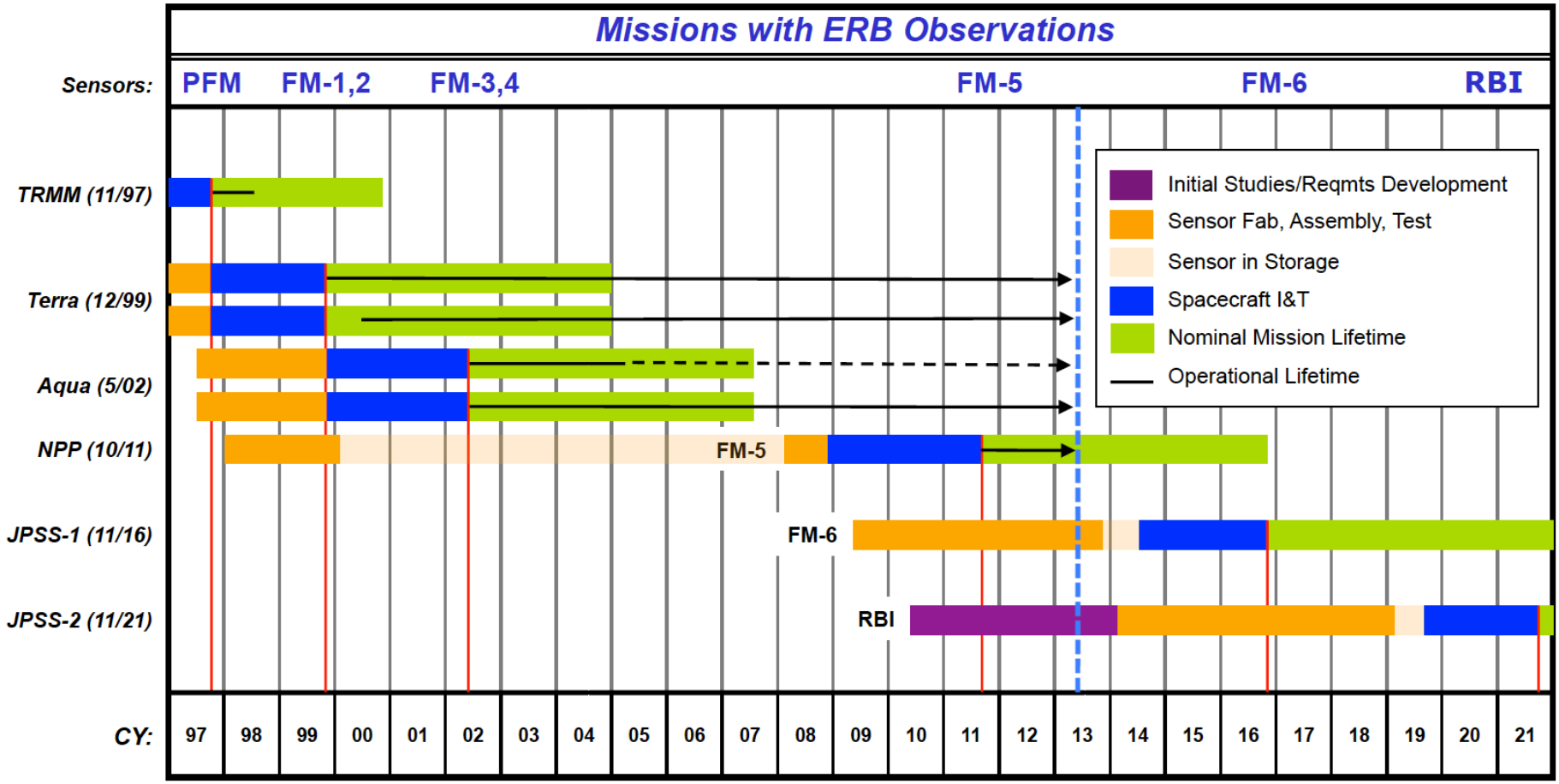
CERES Team Leads

- Principal Investigator: Norman Loeb
- Project Scientist: Kory Priestley

CERES Working Groups:

- Instrument: Kory Priestley
- ERBElike: Takmeng Wong
- Clouds: Pat Minnis (Lead); Bill Smith Jr., (Deputy)
- Inversion: Wenying Su
- SOFA: David Kratz
- SARB: Seiji Kato
- TISA: David Doelling
- FLASHFlux: Paul Stackhouse & David Kratz
- Data Management: Jonathan Gleason
- ASDC: John Kusterer

CERES Flight Schedule

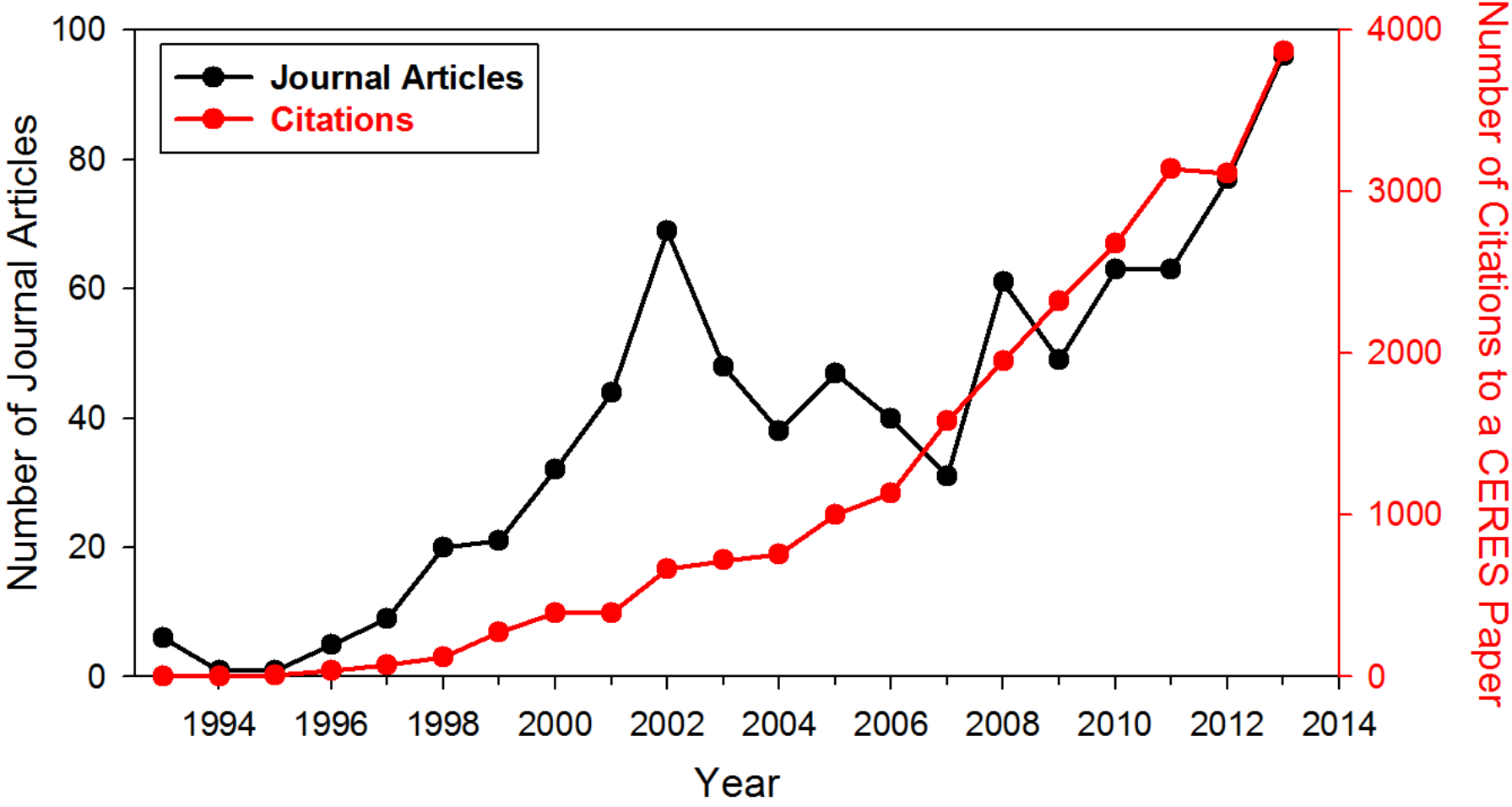


- Five CERES instruments on 3 satellites (Terra, Aqua, SNPP) are flying.
- FM6 will be fly on JPSS-1 in 2016 and the CERES Follow-on (RBI) will fly on JPSS-2 in 2021.

Establishment of the CERES Earth Radiation Budget Measurement Science Team

- Idea is to consolidate CERES Terra, Aqua & SNPP budgets into a single CERES budget line managed by LaRC SD.
- Current CERES budget is split between Terra, Aqua and SNPP missions.
- FM6 and RBI budgets will eventually be added.
- This means CERES team submits and presents its own budget in the NASA Planning, Programming, Budgeting, and Execution (PPBE) process. Starts this year.
- How this will affect CERES involvement in Senior Review process is TBD.

CERES Journal Publication and Citation Counts
(For Papers Between 1993-2013; Updated April 1, 2014)



- Total number of peer-reviewed journal articles: 821
- Total number of citations to CERES papers : 24,250

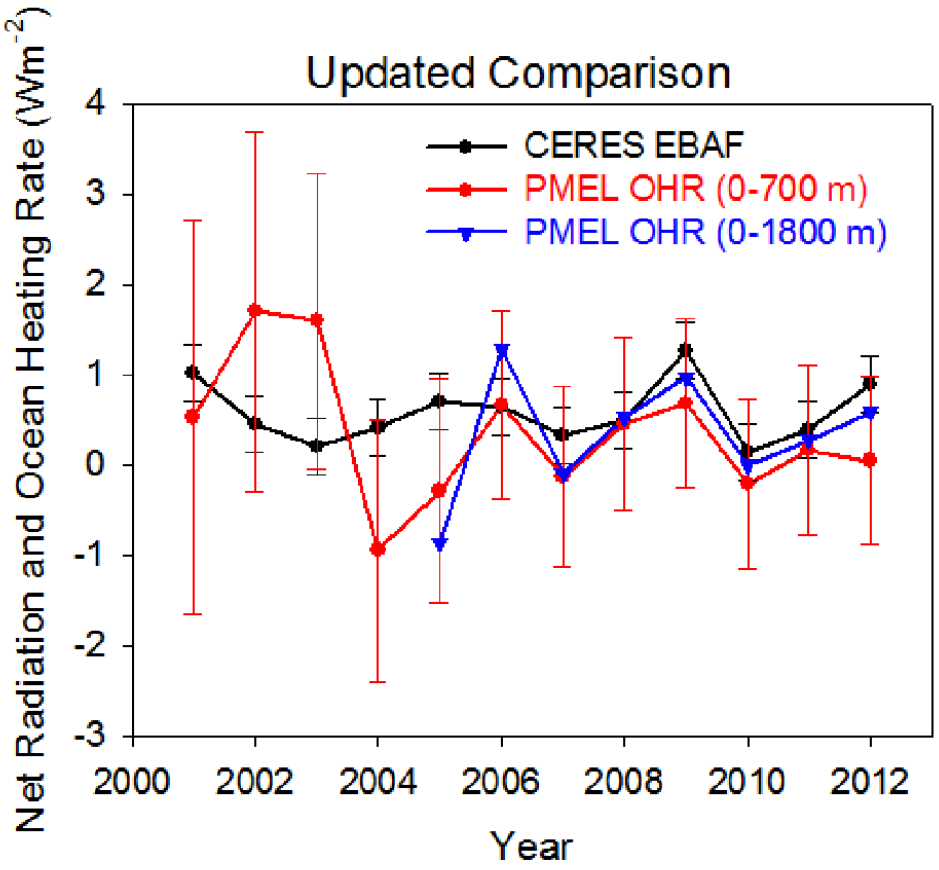
Compiled by Anne Wilber & Dave Kratz

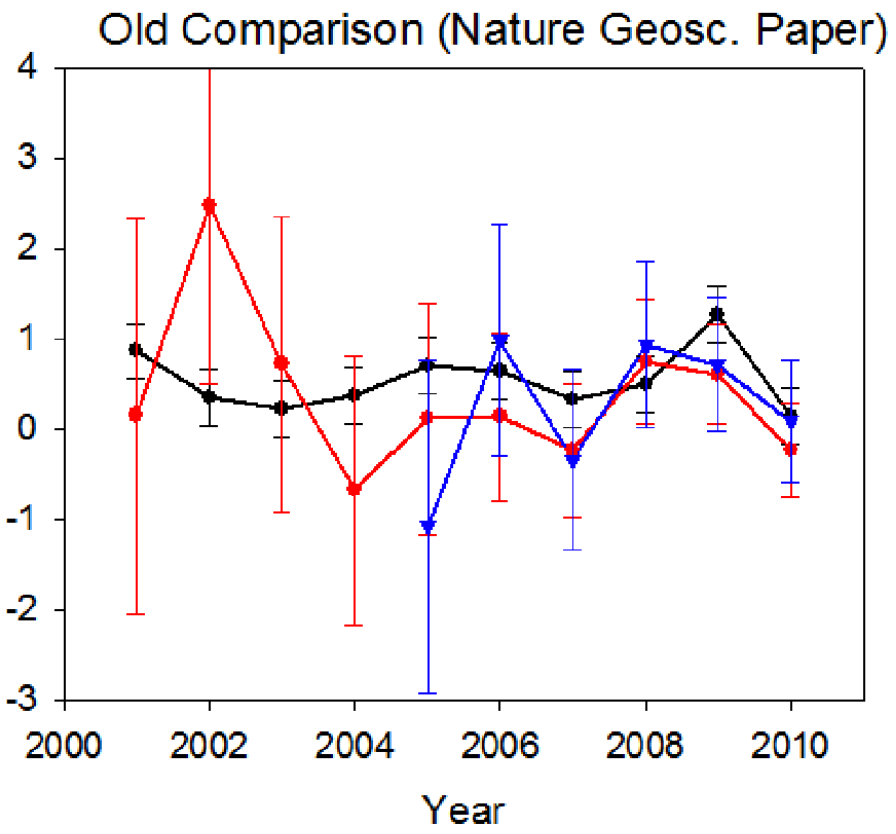
Update on CERES Data Use – Number of Unique Users by Product

Number of Unique Users By Product

Products	2010	2011	2012	2013	2014
EBAF-TOA	72	146	234	379	207
EBAF-Surface			118	217	112
ESG		14	130	151	36
SYN1deg			61	315	115
SYN1deg-lite	41	126	133		
SSF1deg-lite	46	106	93	138	55
ISCCP-D2like	17	12	45	62	18
SSFlevel2	84	77	138	174	63
BDS	11	9	14	8	1
ES4	59	36	11	17	3
ES8	22	20	18	21	4
ES9	21	12	5	9	1
SFC	31	20	14	6	0
NEWS	31	32	33	19	2
MISR-MODIS	9	4	2	5	3
FLASH_SSF	25	8	15	12	4
FLASH_TISA	17	18	20	11	1

Update on CERES Net TOA Flux and Argo Ocean Heating Rate





- Significant improvement after 2006 likely due to better screening of Argo (real time vs delayed mode ARGO data).
- Plan to update comparison through 2013.

CATALYST GOES Live!

- After 2 years of development, the CERES AuTomAted job Loading sYSTem (CATALYST) went live on April 17, 2014.
- CATALYST provides a framework for automation of CERES Product Generation Executive (PGE) execution, coordination & logging.
  - Ingests CERES production requests (PRs) to create collections of jobs
  - Executes jobs on AMI-P cluster
  - Initiates ANGe ingest wrapper scripts (ANGe is ASDC's ingesting, archiving and distribution system).
  - Provides graphical interface for users to manage system
  - CERES Beta2 Ed4 Clouds and Inversion code (8 PGEs) was first to be incorporated into CATALYST.
  - Enables multiple SSF streams (e.g., Terra & Aqua) to be processed simultaneously.
  - Factor of 2-4 increase in throughput through ASDC production system !
  - Will expand to Inversion and CERES Level-3 processing in coming months.

  - Congratulations CATALYST Development and Test Team!

CERES Terra and Aqua Edition 4

-Instrument gains and SRFs: Delivered.

- Improvement to Aqua SW part of TOT SRF.

-CERES Clouds code: Delivered. Several years of Terra and Aqua processed SSF Edition 4-beta2.

-Inversion (ADMs and SOFA) code: Delivered. Currently in testing. Inversion-only runs to produce SSF Edition 4.

-Several SARB and TISA code deliveries within next few months.

- Key decision on suitability of 5-channel GEO cloud retrievals required during this meeting.

Edition 4 Planned Milestones

Product	Science Delivery to DMT	Target Public Release
Ed4 Inversion	ADM November 22, 2013	May 28, 2014
	SOFA January 9, 2014	
Ed4 SSF1deg-Hr	April 21, 2014	June 25, 2014
Ed4 SSF1deg-Day/Month	May 23, 2014	July 15, 2014
Ed4 TSI	June 27, 2014	October 27, 2014
Ed4 SYNI	July 11, 2014	
Ed4 SYN1deg	July 25, 2014	
Ed4 ISCCP-D2like Day/Nit + GEO + MRG	August 29, 2014	March 5, 2015
Ed4 Flux-By-Cloud	October, 31, 2014	December 31, 2014

CERES FM5 SNPP

-CERES FM5 time-varying gains and beginning of mission SRFs to be used in SSF Edition 1.

-Receiving Collection 1.1 calibrated VIIRS radiances from GSFC Land PEATE (Xiong).

-CERES Edition 1 Clouds: Delivered.

-SSF Edition1 will use Edition 4 Aqua ADMs.

-Anticipate “MODIS-Like” VIIRS aerosols from Land PEATE (POCs: Rob Levy & Christina Hsu). Consider including in Edition 2.

NPP & Edition 3 Planned Milestones

Product	Science Delivery to DMT	Target Public Release
Ed3 SSF1deg-Day/Month	May 23, 2014	August 21, 2014
NPP Ed1 Clouds	February 14, 2014	September 26, 2014
NPP Ed1 Inversion	May 9, 2014	
NPP Time Varying Gains (Jan 2012 – Feb 2014)	May 23, 2014	June 13, 2013 (BDS & ERBElike)
NPP Ed1 CRS	November 14, 2014	January 14, 2015

Future Earth Radiation Budget Missions

- Responsibility for sustained climate measurements transferred from NOAA to NASA.
- CERES FM6 to launch on JPSS-1 in Nov 2016.
  - CERES team to produce Earth Radiation Budget Climate Data Records using CERES FM6, closely following FM5/SNPP approach.
- Radiation Budget Instrument (RBI) Status:
  - Draft RFP released in April, 2013
  - Industry-Day April 30, 2013
  - Official RFP release: June 14, 2013
  - Award: Spring 2014
  - RBI delivery date: Spring 2019.
  - Launch on JPSS-2: November 2021.

Arctic Radiation–IceBridge Sea-Ice Experiment (ARISE)

- Field experiment over Arctic Ocean to study Arctic sea-ice, clouds and radiation during late summer to early autumn (August 25-September 26, 2014).
- Consists of airborne polar geophysical project called Operation IceBridge.
  - Goal of IceBridge is to characterize annual changes in thickness of sea ice, glaciers, and ice sheets. Uses LVIS laser altimeter (1064 nm backscatter).
  - Bridges gap between ICESat satellite missions.
- Radiation science goals: Evaluate CERES clouds and radiation products for coincident Terra, Aqua and Suomi NPP satellite overpasses.
- Base of operation: August 27-Sept 2: Thule Air Base, Greenland.
  Sept 4-Sept 24: Fairbanks, AK.
- Aircraft: Wallop's C-130
- Instruments: BBR (Bucholtz), SSFR (Schmidt), 4STAR (Redemann), NAST-I (Noe), LVIS + Digital Camera (Blair), in-situ Probes (Anderson)

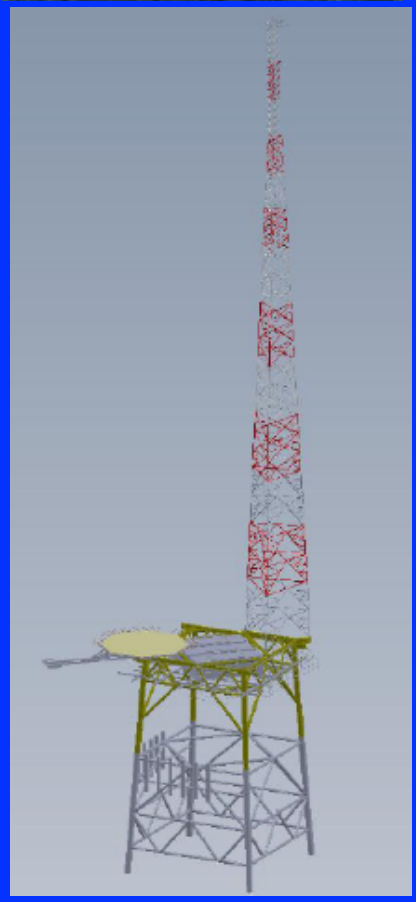
Personnel:

a. Hal Maring – HQ Program Manager, Radiation Sciences
b. Tom Wagner – HQ Program Manager, Cryospheric Sciences
c. Bruce Tagg – HQ Program Manager, Airborne Sciences
d. Christy Hansen – NASA Goddard, IceBridge Project Manager, and Radiative Balance Project Manager
e. Bill Smith – NASA Langley, Science Team Lead

COVE

- DOE purchased Ches Light to create RFORE -- Reference Facility for Offshore Renewable Energy.
- DOE to reach final decision on:

  i) whether to proceed with engineering design (due any day now).
  ii) whether to proceed with construction of 100 m tower.
- Positive decision for both will mean offshore construction during summer of 2016.
- MPLNET is still operating at the lighthouse while we await approval from LAFB and FAA to operate on LaRC.
- The RFORE steering committee proposed an extensive suite of instrumentation, which includes current COVE instrumentation (except MPL).
- COVE uplooking instruments (AERONET, BSRN radiometers) will be located on top of the tower; downlooking radiometers at tower top and/or platform level.
- Meanwhile, the COVE project is still collecting data.
- For more details, see Greg Schuster Presentation Thursday morning.



Upcoming Conferences & Meetings of Interest

European Geophysical Union General Assembly
- April 27–May 2, 2014, Vienna, Austria

14th AMS Conference on Atmospheric Radiation & Cloud Physics
- July 7–11, 2014, Boston, MA

IGARSS 2014
- July 13–18, 2014, Quebec City, Canada

7th International Science Conference on the Global Energy and Water Cycle
- July 14–17, 2014, The Hague, The Netherlands

Fall CERES Science Team Meeting (Joint with ScaRaB & GERB)
- October 6–10, 2014, Toulouse, France

The Climate Symposium 2014
- October 13–17, 2014, Darmstadt, Germany

Fall American Geophysical Union
- December 15–19, 2014, San Francisco, CA

3rd International A-Train Symposium 2015
- March 4–6, 2015, Southern California

Other News

- SORCE successfully transitioned to a new “hybrid” operating mode on Monday, Feb. 24th.
- The hybrid mode allows SORCE to take solar measurements again after an approximate 6-month hiatus due to the loss of another battery cell.
- “Hybrid” Mode: Every orbit SORCE makes solar observations during the daylight part of the orbit, and then put itself into safe-hold every eclipse (to conserve power during nighttime).
- Goal is to operate SORCE until after the TSIS launch in 2017.
- Total Solar Irradiance Calibration Transfer Experiment (TCTE) launched November 4, 2013. Mission duration: 18 months.
- Successful SORCE/TCTE cross-calibration campaign occurred between Dec 22-Dec 28, 2013.
- CERES team is switched to V15 SORCE TIM for Feb03-Jun13.
- For July 2013 onwards, RMIB TSI composite (mainly DIARAD/VIRGO instrument on SOHO) is being used (anchored to SORCE TIM V15).

Other News

- GERB instrument on Meteosat-10, operational since Jan 2013 failed (could not activate the counter spin).
- Met-11 will be launched next year but will be in storage for a few years and activated when Met-10 has been in operation for a few years.
- Currently, GERB team is using Met-9 GERB at 10°E with Met-10 imager data from 0°E longitude.
- ScaRaB/Megha-Tropiques – Functioning nominally
- CALIPSO – Functioning nominally
- CloudSat – Returned to the A-Train. Nominal Daylight Only Operations (DO-Op) continue.
- Deep Space Climate Observatory (DSCOVR) is to be launched in early 2015.
  - ROSES Solicitation: A.22, DSCOVR Earth Science Algorithms.
  - NOI due: May 12, 2014. Proposals due: July 14, 2014.

End